A cytogenetics information system for automating quality assurance and quality improvement documentation in the clinical laboratory

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Background. An automated means was sought to facilitate the processing of cytogenetic Quality Control(QC) and Quality Assurance(QA) data. It was hypothesized that specimen turn around time (TAT; time from receipt of specimen until release of report) and reporting accuracy could be improved, not only through automation of QA and QC, but by automating additional laboratory clerical processes. The automation of such processes should lead to overall Quality Improvement (QI).

System. The clinical cytogenetics laboratory at the University of Missouri Health Sciences Center designed and implemented an information system to address QC, QA, and QI using File Maker Pro version 3.0 (Claris Corp., Santa Clara) because of its ease in rapid prototyping and its cross-platform capabilities. The QA and QC module automates computation of TATs and the percent of cases adhering to the College of American Pathologists'(CAP) Cytogenetic specimen TAT guidelines.[1] In addition, the module automates CAP documentation for abnormal specimens and documentation of corrective action taken for sub-optimal growth samples.

QI processes monitored/automated include:

1) case tracking for timely completion
2) report writing with access to report library containing 120 pre-written reports
3) billing documentation
4) worksheet and label generation
5) technologist workload
6) computations for participation in external multi-center genetics group

Evaluation. To complete the above tasks manually at the M.U. cytogenetics laboratory takes over 800 hours based on a caseload of 1,000 specimens per year. The time saved using the computerized system has allowed the laboratory to operate without a clerical or secretarial support since its implementation. Most noteworthy is that previously, manual QC and QA processing was typically performed 2 - 3 times a year due to its time-consuming nature. Currently, the automated system's ability to execute QC and QA on a regular basis or on command allows the laboratory to better pinpoint and rectify specimen-processing problems in a more timely manner.

The case-tracking interface has dramatically improved the monitoring of in-house case completion. The viewing of cases, sorted by the number of days in house with priority handling status provides laboratory personnel up to the minute information for optimal caseload management.

Conclusions. Development and implementation of a computer software program for cytogenetic laboratory data management resulted in significant improvements in cost- and labor-efficiencies and in the quality of cytogenetics results. The migration of this prototype to a more robust system will be of significant value to laboratory medicine as its use is expanded to monitor other types of QA and QC parameters.

References:

[1] College of American Pathologists: Commission on Laboratory Accreditation Inspection Checklist - Cytogenetics Section: 9; 1996 10-11.

Acknowledgments

This work is supported in part by grant 5T15LM07089 from the National Library of Medicine.

1091—8280/97/$5.00